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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 09/939,258
Filing Date: August 24, 2001
Appellant(s): DERDERIAN, JAMES M.

Brick G. Power
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 5-27-8 appealing from the Office action mailed 11-19-7.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is substantially correct. The changes are as follows:

(A) The 35 U.S.C. § 103(a) rejections of claims 1, 5-8, 10-23, 25, 28, 31, 32, 34, 35, 53, and 54 for reciting subject matter that is ~~assertedly~~ unpatentable over the teachings of U.S. Patent 6,724,084 to Hikita et al. (hereinafter "Hikita") and U.S. Patent 6,835,898 to Eldridge et al. (hereinafter "Eldridge"); and

(B) The rejections of claims 16, 30, and 33 under 35 U.S.C. § 103(a) for being drawn to subject matter that is ~~purportedly~~ unpatentable over the subject matter taught

in Hikita and Eldridge and, further, in view of teachings from U.S. Patent 6,593,662 to Pu et al. (hereinafter "Pu").

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(**8) Evidence Relied Upon**

The following evidence is relied upon by the examiner in the rejection of the claims under appeal:

6,724,084	HIKITA	9-2004
6,835,898	ELDRIDGE	12-2004
6,593,662	PU	7-2003

The following is evidence relied upon only In the response to argument:

59108341	INAGAKI	6-1984
6,162,665	ZOMMER	12-2000
6,124,179	ADAMIC	9-2000
5,654,226	TEMPLE	8-1997

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1, 5-8, 10-23, 25, 28, 31, 32, 34, 35, 53 and 54 stand rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Hikita (6724084) and Eldridge (6835898).

At column 11, lines 24-44; column 12, lines 28-33; column 12, line 53 to column 13, line 52; column 14, lines 3-18; column 14, line 60 to column 15, line 6; column 15, lines 27-39; column 18, line 34 to column 19, line 38; and column 20, lines 33-36, Hikita discloses the following:

Re claim 1: A semiconductor device assembly, comprising: at least one semiconductor device 1; and at least one inherently compressible spacer BD protruding from an active surface of the at least one semiconductor device, the at least one compressible spacer inherently defining a distance the active surface of the at least one semiconductor device is to be spaced apart from a back side of another semiconductor device 2 to be positioned in superimposed relation with the at least one semiconductor device.

Re claim 5: The semiconductor device assembly re claim 1, comprising a plurality of spacers that are arranged to stably support the another semiconductor device.

Re claim 6: The semiconductor device assembly re claim 1, further comprising: the another semiconductor device positioned adjacent the at least one compressible spacer, opposite from the at least one semiconductor device.

Re claim 7: The semiconductor device assembly re claim 6, further comprising: adhesive material 3 between the at least one semiconductor device and the another semiconductor device.

Re claim 8: The semiconductor device assembly re claim 7, wherein the adhesive material is located between adjacent spacers.

Re claim 10: The semiconductor device assembly re claim 1, wherein the at least one compressible spacer comprises electrically conductive material.

Re claim 11: The semiconductor device assembly re claim 10, wherein the at least one compressible spacer communicates with a “ground” plane of the at least one semiconductor device.

Re claim 12: The semiconductor device assembly re claim 1, further comprising: a substrate 14 with which at least one semiconductor device is associated.

Re claim 13: The semiconductor device assembly re claim 12, wherein the substrate comprises at least one of a circuit board, an interposer, a semiconductor device, and leads.

Re claim 14: The semiconductor device assembly re claim 12, wherein at least one bond pad 12 of the at least one semiconductor device is in communication with a corresponding contact area of the substrate.

Re claim 15: The semiconductor device assembly re claim 14, further comprising: at least one discrete conductive element 13 extending from the at least one bond pad, over an active surface of the at least one semiconductor device, to the corresponding contact area.

Re claim 16: The semiconductor device assembly re claim 15, wherein heights of the at least one compressible spacer exceeds a maximum height the at least one discrete conductive element protrudes above the active surface.

Re claim 17: The semiconductor device assembly re claim 1, wherein the at least one compressible spacer is secured to noncircuit bond pads 52 of the at least one semiconductor device.

Re claim 18: A semiconductor device assembly, comprising: a substrate; a first semiconductor device associated with the substrate, bond pads of the first semiconductor device in communication with corresponding contact areas of the substrate; mutually laterally spaced discrete spacers positioned on and protruding from an active surface of the first semiconductor device, at least one spacer of the mutually laterally discrete spacers being in communication with a “ground” or reference voltage plane of the first semiconductor device; and a second semiconductor device comprising a back side positioned on the mutually laterally spaced discrete spacers, the at least one spacer establishing communication between the back side of the second semiconductor device and the ground or reference voltage plane.

Re claim 19: The semiconductor device assembly re claim 18, wherein the substrate comprises one of a circuit board, an interposer, another semiconductor device, and leads.

Re claim 20: The semiconductor device assembly re claim 18, wherein the bond pads and the corresponding contact areas communicate by way of discrete conductive elements positioned therebetween.

Re claim 21: The semiconductor device assembly re claim 20, wherein the discrete conductive elements comprise at least one of bond wires, tape-automated bond elements, and thermocompression bonded leads.

Re claim 22: The semiconductor device re claim 18, wherein the mutually laterally spaced discrete spacers are secured to noncircuit bond pads of the first semiconductor device.

Re claim 23: The semiconductor device assembly re claim 22, wherein the mutually laterally spaced discrete spacers comprise conductive material.

Re claim 25: The semiconductor device assembly re claim 23, wherein the mutually laterally spaced discrete spacers are in communication with a ground or reference voltage plane of the first semiconductor device.

Re claim 28: The semiconductor device assembly re claim 18, wherein at least one of the mutually laterally spaced discrete spacers is compressible.

Re claim 30: The semiconductor device assembly re claim 18, wherein the bond pads communicate with the corresponding contact areas of the substrate by way of discrete conductive elements positioned therebetween.

Re claim 31: The semiconductor device assembly re claim 18, further comprising: an adhesive layer between the first semiconductor device and the second semiconductor device.

Re claim 32: The semiconductor device assembly re claim 31, wherein at least some of the mutually laterally spaced discrete spacers extend through the adhesive layer.

Re claim 34: The semiconductor device assembly re claim 18, further comprising: an encapsulant material 3 substantially covering the first semiconductor device, the second semiconductor device, discrete conductive elements, and portions of the substrate located adjacent to the first semiconductor device.

Re claim 35: The semiconductor device assembly re claim 18, further comprising: at least one external connective element 14 carried by the substrate and in electrical communication with at least one corresponding contact area of the substrate.

Re claim 53: The semiconductor device assembly re claim 1, wherein the at least one compressible spacer is secured to a contact pad of the at least one semiconductor device.

Re claim 54: The semiconductor device assembly re claim 18, wherein the at least one spacer is secured to a contact pad of at least one of the first semiconductor device and the second semiconductor device.

To further clarify, Hikita discloses an inherently compressible spacer because the term “compressible” merely limits the scope of the claims to the intended use of the spacer; namely, to the intended use of being pressed or squeezed, and does not

appear to result in a structural difference between the claimed spacer and the spacer of the applied prior art. Further, because the spacer of Hikita appears to have the same structure as the claimed spacer, it appears to be capable of being used for the intended use, and the intended use does not patentably distinguish the claimed spacer from the spacer of Hikita. The manner in which a product operates is not germane to the issue of patentability of the product; Ex parte Wikdahl 10 USPQ 2d 1546, 1548 (BPAI 1989); Ex parte McCullough 7 USPQ 2d 1889, 1891 (BPAI 1988); In re Finsterwalder 168 USPQ 530 (CCPA 1971); In re Casey 152 USPQ 235, 238 (CCPA 1967). Also, "Expressions relating the apparatus to contents thereof during an intended operation are of no significance in determining patentability of the apparatus claim."; Ex parte Thibault, 164 USPQ 666, 667 (Bd. App. 1969). And, "Inclusion of material or article worked upon by a structure being claimed does not impart patentability to the claims."; In re Young, 25 USPQ 69 (CCPA 1935) (as restated in In re Otto, 136 USPQ 458, 459 (CCPA 1963)). And, claims directed to product must be distinguished from the prior art in terms of structure rather than function. In re Danley, 120 USPQ 528, 531 (CCPA 1959). "Apparatus claims cover what a device is, not what a device does [or is intended to do]." Hewlett-Packard Co. v. Bausch & Lomb Inc., 15 USPQ2d 1525, 1528 (Fed. Cir. 1990).

> MPEP 2111.01 [R-5] Plain Meaning
>
> I. THE WORDS OF A CLAIM MUST BE GIVEN THEIR "PLAIN MEANING" UNLESS **>SUCH MEANING IS INCONSISTENT WITH< THE SPECIFICATION
>
> **> Although< claims of issued patents are interpreted in light of the specification, prosecution history, prior art and other claims, this is not the mode of claim interpretation to be applied during examination. During examination, the claims must be interpreted as broadly as their terms reasonably allow. In re American Academy of

Science Tech Center, 367 F.3d 1359, 1369, 70 USPQ2d 1827, 1834 (Fed. Cir. 2004) (The USPTO uses a different standard for construing claims than that used by district courts; during examination the USPTO must give claims their broadest reasonable interpretation >in light of the specification<.). This means that the words of the claim must be given their plain meaning unless **>the plain meaning is inconsistent with< the specification. In re Zletz, 893 F.2d 319, 321, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989) (discussed below); Chef America, Inc. v. Lamb-Weston, Inc., 358 F.3d 1371, 1372, 69 USPQ2d 1857 (Fed. Cir. 2004) (Ordinary, simple English words whose meaning is clear and unquestionable, absent any indication that their use in a particular context changes their meaning, are construed to mean exactly what they say. Thus, "heating the resulting batter-coated dough to a temperature in the range of about 400oF to 850oF" required heating the dough, rather than the air inside an oven, to the specified temperature.). **

>II. IT IS IMPROPER TO IMPORT CLAIM LIMITATIONS FROM THE SPECIFICATION

"Though understanding the claim language may be aided by explanations contained in the written description, it is important not to import into a claim limitations that are not part of the claim. For example, a particular embodiment appearing in the written description may not be read into a claim when the claim language is broader than the embodiment." Superguide Corp. v. DirecTV Enterprises, Inc., 358 F.3d 870, 875, 69 USPQ2d 1865, 1868 (Fed. Cir. 2004). See also Liebel-Flarsheim Co. v. Medrad Inc., 358 F.3d 898, 906, 69 USPQ2d 1801, 1807 (Fed. Cir. 2004)(discussing recent cases wherein the court expressly rejected the contention that if a patent describes only a single embodiment, the claims of the patent must be construed as being limited to that embodiment);< E-Pass Techs., Inc. v. 3Com Corp., 343 F.3d 1364, 1369, 67 USPQ2d 1947, 1950 (Fed. Cir. 2003) ("Interpretation of descriptive statements in a patent's written description is a difficult task, as an inherent tension exists as to whether a statement is a clear lexicographic definition or a description of a preferred embodiment. The problem is to interpret claims in view of the specification' without unnecessarily importing limitations from the specification into the claims."); Altiris Inc. v. Symantec Corp., 318 F.3d 1363, 1371, 65 USPQ2d 1865, 1869-70 (Fed. Cir. 2003) (Although the specification discussed only a single embodiment, the court held that it was improper to read a specific order of steps into method claims where, as a matter of logic or grammar, the language of the method claims did not impose a specific order on the performance of the method steps, and the specification did not directly or implicitly require a particular order). See also paragraph *>IV.<, below. **>When< an element is claimed using language falling under the scope of 35 U.S.C. 112, 6th paragraph (often broadly referred to as means or step plus function language)**, the specification must be consulted to determine the structure, material, or acts corresponding to the function recited in the claim. In re Donaldson, 16 F.3d 1189, 29 USPQ2d 1845 (Fed. Cir. 1994) (see MPEP § 2181- § 2186). In In re Zletz, supra, the examiner and the Board had interpreted claims reading "normally solid polypropylene" and "normally solid polypropylene having a crystalline polypropylene content" as being limited to "normally solid linear high homopolymers of propylene which have a crystalline polypropylene content." The court ruled that limitations, not present in the claims, were improperly imported from the specification. See also In re Marosi, 710 F.2d 799, 218 USPQ 289 (Fed. Cir. 1983) ("Claims are not to be read in a vacuum, and limitations therein are to be interpreted in light of the specification in giving them their broadest reasonable interpretation'." 710 F.2d at 802, 218 USPQ at 292 (quoting In re Okuzawa, 537 F.2d 545, 548, 190 USPQ 464, 466 (CCPA 1976)) (emphasis in original). The court looked to the specification to construe "essentially free of alkali metal" as including

unavoidable levels of impurities but no more.). Compare In re Weiss, 989 F.2d 1202, 26 USPQ2d 1885 (Fed. Cir. 1993) (unpublished decision - cannot be cited as precedent) (The claim related to an athletic shoe with cleats that "break away at a preselected level of force" and thus prevent injury to the wearer. The examiner rejected the claims over prior art teaching athletic shoes with cleats not intended to break off and rationalized that the cleats would break away given a high enough force. The court reversed the rejection stating that when interpreting a claim term which is ambiguous, such as "a preselected level of force", we must look to the specification for the meaning ascribed to that term by the inventor." The specification had defined "preselected level of force" as that level of force at which the breaking away will prevent injury to the wearer during athletic exertion.**)

*>III. < "PLAIN MEANING" REFERS TO THE ORDINARY AND CUSTOMARY MEAN-ING GIVEN TO THE TERM BY THOSE OF ORDINARY SKILL IN THE ART

"[T]he ordinary and customary meaning of a claim term is the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention, i.e., as of the effective filing date of the patent application." Phillips v. AWH Corp., *>415 F.3d 1303, 1313<, 75 USPQ2d 1321>, 1326< (Fed. Cir. 2005) (en banc). Sunrace Roots Enter. Co. v. SRAM Corp., 336 F.3d 1298, 1302, 67 USPQ2d 1438, 1441 (Fed. Cir. 2003); Brookhill-Wilk 1, LLC v. Intuitive Surgical, Inc., 334 F.3d 1294, 1298 67 USPQ2d 1132, 1136 (Fed. Cir. 2003)("In the absence of an express intent to impart a novel meaning to the claim terms, the words are presumed to take on the ordinary and customary meanings attributed to them by those of ordinary skill in the art."). It is the use of the words in the context of the written description and customarily by those skilled in the relevant art that accurately reflects both the "ordinary" and the "customary" meaning of the terms in the claims. Ferguson Beauregard /Logic Controls v. Mega Systems, 350 F.3d 1327, 1338, 69 USPQ2d 1001, 1009 (Fed. Cir. 2003) (Dictionary definitions were used to determine the ordinary and customary meaning of the words "normal" and "predetermine" to those skilled in the art. In construing claim terms, the general meanings gleaned from reference sources, such as dictionaries, must always be compared against the use of the terms in context, and the intrinsic record must always be consulted to identify which of the different possible dictionary meanings is most consistent with the use of the words by the inventor.); ACTV, Inc. v. The Walt Disney Company, 346 F.3d 1082, 1092, 68 USPQ2d 1516, 1524 (Fed. Cir. 2003) (Since there was no >express< definition given for the term "URL" in the specification, the term should be given its broadest reasonable interpretation >consistent with the intrinsic record< and take on the ordinary and customary meaning attributed to it by those of ordinary skill in the art; thus, the term "URL" was held to encompass both relative and absolute URLs.); and E-Pass Technologies, Inc. v. 3Com Corporation, 343 F.3d 1364, 1368, 67 USPQ2d 1947, 1949 (Fed. Cir. 2003) (Where no explicit definition for the term "electronic multi-function card" was given in the specification, this term should be given its ordinary meaning and broadest reasonable interpretation; the term should not be limited to the industry standard definition of credit card where there is no suggestion that this definition applies to the electronic multi-function card as claimed, and should not be limited to preferred embodiments in the specification.). The ordinary and customary meaning of a term may be evidenced by a variety of sources, >including "the words of the claims themselves, the remainder of the specification, the prosecution history, and extrinsic evidence concerning relevant scientific principles, the meaning of technical terms, and the state of the art."< Phillips v. AWH Corp., *>415 F.3d at 1314<, 75 USPQ2d **>at 1327.< If extrinsic reference sources, such as dictionaries, evidence more than one definition for the term, the intrinsic record must be consulted to identify

> which of the different possible definitions is most consistent with applicant's use of the terms. Brookhill-Wilk 1, 334 F. 3d at 1300, 67 USPQ2d at 1137; see also Renishaw PLC v. Marposs Societa ' per Azioni, 158 F.3d 1243, 1250, 48 USPQ2d 1117, 1122 (Fed. Cir. 1998) ("Where there are several common meanings for a claim term, the patent disclosure serves to point away from the improper meanings and toward the proper meanings.") and Vitronics Corp. v. Conceptronic Inc., 90 F.3d 1576, 1583, 39 USPQ2d 1573, 1577 (Fed. Cir. 1996) (construing the term "solder reflow temperature" to mean "peak reflow temperature" of solder rather than the "liquidus temperature" of solder in order to remain consistent with the specification.). If more than one extrinsic definition is consistent with the use of the words in the intrinsic record, the claim terms may be construed to encompass all consistent meanings. ** See *>e.g.,< Rexnord Corp. v. Laitram Corp., 274 F.3d 1336, 1342, 60 USPQ2d 1851, 1854 (Fed. Cir. 2001)(explaining the court's analytical process for determining the meaning of disputed claim terms); Toro Co. v. White Consol. Indus., Inc., 199 F.3d 1295, 1299, 53 USPQ2d 1065, 1067 (Fed. Cir. 1999)("[W]ords in patent claims are given their ordinary meaning in the usage of the field of the invention, unless the text of the patent makes clear that a word was used with a special meaning."). Compare MSM Investments Co. v. Carolwood Corp., 259 F.3d 1335, 1339-40, 59 USPQ2d 1856, 1859-60 (Fed. Cir. 2001) (Claims directed to a method of feeding an animal a beneficial amount of methylsulfonylmethane (MSM) to enhance the animal's diet were held anticipated by prior oral administration of MSM to human patients to relieve pain. Although the ordinary meaning of "feeding" is limited to provision of food or nourishment, the broad definition of "food" in the written description warranted finding that the claimed method encompasses the use of MSM for both nutritional and pharmacological purposes.); and Rapoport v. Dement, 254 F.3d 1053, 1059-60, 59 USPQ2d 1215, 1219-20 (Fed. Cir. 2001) (Both intrinsic evidence and the plain meaning of the term "method for treatment of sleep apneas" supported construction of the term as being limited to treatment of the underlying sleep apnea disorder itself, and not encompassing treatment of anxiety and other secondary symptoms related to sleep apnea.).

In light of MPEP 2111.01 supra, the following is further clarified:

Re claim 1: a back side.

Re claim 18: a back side.

Specifically, it is noted that the term "back" is a relative term with the plain meaning defined as "the reverse side," (The American Heritage® Dictionary of the English Language: Fourth Edition. 2000); and the side of the another/second semiconductor device of Hikita is inherently the reverse side (back) of the another/second semiconductor device relative to the opposite side of the another/second semiconductor device.

Moreover, the term “back side” is not defined in the instant specification, nor is the scope of the term otherwise limited to a non-active side of a semiconductor device.

In any case, the following limitations are statements of intended use:

Re claim 1: to be spaced apart from a back side of another semiconductor device to be positioned in superimposed relation with the at least one semiconductor device.

Re claim 5: to stably support the another semiconductor device.

Therefore, the scope of claims 1 and 5 is not structurally limited to another semiconductor device and the statements of intended use do not appear to otherwise result in a structural difference between the claimed device and the device of Hikita. Further, because the device of Hikita appears to have the same structure as the claimed device, it appears to be capable of being used for the intended uses, and the statements of intended use do not patentably distinguish the claimed device from the device of Hikita. The manner in which a product operates is not germane to the issue of patentability of the product; Ex parte Wikdahl 10 USPQ 2d 1546, 1548 (BPAI 1989); Ex parte McCullough 7 USPQ 2d 1889, 1891 (BPAI 1988); In re Finsterwalder 168 USPQ 530 (CCPA 1971); In re Casey 152 USPQ 235, 238 (CCPA 1967). Also, "Expressions relating the apparatus to contents thereof during an intended operation are of no significance in determining patentability of the apparatus claim."; Ex parte Thibault, 164 USPQ 666, 667 (Bd. App. 1969). And, "Inclusion of material or article worked upon by a structure being claimed does not impart patentability to the claims."; In re Young, 25 USPQ 69 (CCPA 1935) (as restated in In re Otto, 136 USPQ 458, 459 (CCPA 1963)). And, claims directed to product must be distinguished from the prior art in terms of

structure rather than function. In re Danley, 120 USPQ 528, 531 (CCPA 1959). "Apparatus claims cover what a device is, not what a device does [or is intended to do]." Hewlett-Packard Co. v. Bausch & Lomb Inc., 15 USPQ2d 1525, 1528 (Fed. Cir. 1990).

However, Hikita does not appear to explicitly disclose resiliently compressible spacers.

Nonetheless, at column 58, lines 31-43; column 59, lines 24-28 and 38-51; column 59, line 62 to column 60, line 8; column 61, lines 23-34; column 62, lines 26-41; column 77, lines 8-45; column 97, line 66 to column 98, line 18; column 132, line 66 to column 133, line 12; and column 133, line 41 to column 134, line 176, Eldridge discloses resiliently compressible spacers “contact structures.” In addition, it would have been obvious to combine this disclosure of Eldridge with the disclosure of Hikita by substituting or combining the spacers of Eldridge for or with the spacers of Hikita because, as disclosed by Eldridge as cited, since the spacers have high aspect (height: width) ratios, cleaning (e.g., of solder flux) and inspectability would be increased as compared with traditional solder-bump type flip-chip surface mount processes such as the spacers of Hikita; the same spacers can be used for demountable or permanent attachment of the electronic component; the spacers can be used as a standard means of interconnect between substrates and components which have matching patterns of terminals; the self-planarizing feature of the spacers (i.e., resilient spacers originating from different levels can all be made to terminate in a common plane) affords many opportunities not present with prior art interconnection techniques; the spacers can be bonded to a terminal that is skewed with respect to other terminals; the spacers have

high electrical conductivity (low resistivity) in order that constriction resistance and bulk resistance are low; the spacers have high thermal conductivity so that joule heat ($I^2 R$) is rapidly conducted away from the spacers interface; the spacers have softness, so that a-spots are large, thereby providing low constriction resistance; the spacers have high hardness for low mechanical wear; the spacers have high strength to provide the ability to serve as a spacer and cantilever beam to give low mechanical wear; the spacers have high noble metal content for extended shelf life, low electrical noise and excellent reliability; the spacers have the ability to form extremely thin lubricating films, but not an excess of frictional polymer; and the spacers have low cost.

Also, Hikita and Eldridge do not appear to explicitly disclose wherein heights of the at least one resiliently compressible spacer exceeds a maximum height the at least one discrete conductive element protrudes above the active surface.

Notwithstanding, as reasoned from well established legal precedent, it would have been an obvious matter of design choice bounded by well known manufacturing constraints and ascertainable by routine experimentation and optimization to choose these particular dimensions because appellant has not disclosed that, **in view of the applied prior art**, the dimensions are for a particular **unobvious** purpose, produce an unexpected result, or are otherwise critical, and it appears prima facie that the process would possess utility using another dimension. Indeed, it has been held that mere dimensional limitations are prima facie obvious absent a disclosure that the limitations are for a particular **unobvious** purpose, produce an unexpected result, or are otherwise critical. See, for example, In re Rose, 220 F.2d 459, 105 USPQ 237 (CCPA 1955); In re

Rinehart, 531 F.2d 1048, 189 USPQ 143 (CCPA 1976); Gardner v. TEC Systems, Inc., 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984); In re Dailey, 357 F.2d 669, 149 USPQ 47 (CCPA 1966).

Claims 16, 30 and 33 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Hikita and Eldridge as applied to claims 15 and 18, and further in combination with Pu (6593662).

Hikita and Eldridge do not appear to explicitly disclose the following:

Re claim 16: The semiconductor device assembly re claim 15, wherein heights of the at least one compressible spacer exceeds a maximum height the at least one discrete conductive element protrudes above the active surface.

Still, at column 1, lines 25-48; column 2, lines 17-20 and 30-42; and column 3, line 66 to column 5, line 32, Pu discloses wherein heights of at least one spacer 204b, 220, 204c exceeds a maximum height an at least one discrete conductive element 210a protrudes above a surface 201. Moreover, it would have been obvious to combine this disclosure of Pu with the disclosure of Hikita and Eldridge because, as disclosed by Pu, it would facilitate provision of a stacked-die package structure capable of stacking dies having substantially the same size and bonding pads around the peripheral sides of the dies.

Also, Hikita and Eldridge do not appear to explicitly disclose the following:

Re claim 30: The semiconductor device assembly re claim 18, wherein bond pads of the second semiconductor device communicate with the corresponding contact areas of the substrate by way of discrete conductive elements positioned therebetween.

Re claim 33: The semiconductor device assembly re claim 18, further comprising: at least one additional semiconductor device positioned over the second semiconductor device.

Regardless, as cited, Pu discloses wherein bond pads 222 of a second semiconductor device 208 communicate with corresponding contact areas of a substrate 202 by way of discrete conductive elements 210b positioned therebetween and at least one additional semiconductor device “a number of dies” positioned over the second semiconductor device. Furthermore, it would have been obvious to combine this disclosure of Pu with the disclosure of Hikita and Eldridge because it would facilitate provision of a stacked-die package structure capable of stacking a number of dies having substantially the same size and bonding pads around the peripheral sides of the dies.

(10) Response to Argument

Appellant argues:

> As the Office has noted at pages 8 and 9 of the final Office Action, and as is readily understood by those of ordinary skill in the art, the "back side" of a semiconductor device is the surface that is opposite from the active surface. . . . These definitions are consistent with usage of the term "back side" throughout the specification and in the claims of the above-referenced application. . . . With respect to the subject matter recited in independent claim 1, it is first submitted that neither Hikita nor Eldridge teaches or suggests an assembly with an active surface of at least one semiconductor device facing the back side of another semiconductor device, let alone an assembly in which at least one spacer defines a distance that the active surface of the at least one semiconductor device is spaced apart from the back side of the another semiconductor device. Instead, the teachings of both Hikita and Eldridge are limited to assemblies in which the active surfaces of two superimposed semiconductor devices face each other. Neither Hikita nor Eldridge suggests that two superimposed semiconductor device may be oriented in any other way.

These arguments are respectfully traversed because it is not noted anywhere in the final Office action that the back side of a semiconductor device is necessarily the surface that is opposite from the active surface. In any case, to avoid further misinterpretation, the remarks at pages 8 and 9 of the final Office action have been revised in the grounds of rejection supra.

Furthermore, as evidenced by the following patent disclosures submitted in the Office action entered on 11-19-7, it is respectfully submitted that one skilled in the art would not readily understand that the back side of a semiconductor device is necessarily the surface that is opposite from the active surface; nor would the alleged disclosures of Hikita and Eldridge of active surfaces facing each other necessarily preclude the disclosures of Hikita of a back side because a back side and an active surface are not mutually exclusive:

Inagaki (JP59108341), English abstract, **"back sides as active regions"**; Zommer (6162665), column 4, line 63, column 5, lines 23-24, column 5, line 67 to column 6, line 1, column 6, lines 10-11 and column 7, lines 9-10, **"active devices on the backside"**; Adamic (6124179), column 4, line 26 and column 15, line 61, **"backside ohmic contacts or active junctions"**; and Temple (5654226), column 2, lines 64-65, **"the device wafer 10 may be partially processed on the backside to create a plurality of active areas 14."**

Appellant also suggests:

> . . . without the benefit of hindsight that the Examiner has enjoyed in examining the above-referenced application . . .

This suggestion of impermissible hindsight is respectfully traversed because it has been recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning; yet, so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was conceived, and so long as it does not include knowledge gleaned only from applicant's disclosure, such a reconstruction is proper. In re McLaughlin, 443 F.2d 1392; 170 USPQ 209 (CCPA 1971). To this end, it is respectfully submitted that these criteria are satisfied in the rejection of the instant invention.

Appellant continues:

> . . . there would have been no motivation for one of ordinary skill in the art to combine teachings from two references that are limited to superimposed semiconductor devices with active surfaces that face one another to develop an assembly in which devices with active surfaces that face in the same direction [sic].

This allegation is respectfully deemed unpersuasive because it is not necessarily maintained in the Office action that there would have been motivation, or any other rationale, to develop an assembly in which devices with active surfaces face in the same direction.

Furthermore, motivation to combine the applied prior art is unnecessary. "The obviousness inquiry cannot be confined by a formalistic conception of the words teaching, suggestion, and motivation, or by overemphasis on the importance of published articles and the explicit content of issued patents." KSR International Co. v. Teleflex Inc., 82 USPQ2d 1385 (U.S. 2007). Similarly, as expounded in Ex parte Jones, 62 USPQ2d 1206 (BdPatApp&Int 2001), "The applicant and the examiner have

apparently assumed that there always must be 'motivation' to combine teachings of the prior art to support a rejection based on §103(a). The assumption is not correct. The word 'motivation' or a word similar to 'motivation' does not appear in 35 U.S.C. § 103(a). While a finding of 'motivation' supported by substantial evidence probably will support combining teachings of different prior art references to establish a *prima facie* obviousness case, it is not always necessary. For example, where a claimed apparatus requiring Phillips head screws differs from a prior art apparatus describing the use of flathead screws, it might be hard to find motivation to substitute flathead screws with Phillips head screws to arrive at the claimed invention. However, the prior art would make it more than clear that Phillips head screws and flathead screws are viable alternatives serving the same purpose. Hence, the prior art would 'suggest' substitution of flathead screws for Phillips head screws albeit the prior art might not 'motivate' use of Phillips head screws in place of flathead screws. What must be established to sustain an obviousness rejection is a legally sufficient rationale as to why the claimed subject matter, as a whole, would have been obvious notwithstanding a difference between claimed subject matter and a reference which is prior art under 35 U.S.C. § 102. Once a difference is found to exist, then the examiner must articulate a legally sufficient rationale in support of a §103(a) rejection."

To this end, the instant Office action provides legally sufficient rationale as to why the claimed subject matter, as a whole, would have been obvious.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

David E. Graybill

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